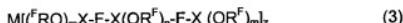


## CLAIMS

1. A method for preparing salts of weakly coordinating anions of the type corresponding to the following formula (1), (2) or (3):



wherein, in a first step an organyl compound of an element  $XR_m$  is reacted with a partially or completely fluorinated alcohol  $^FROH$  in an organic, aprotic solvent and then, in a second step, the resulting alkoxy compound of the element  $X(OR^F)_m$  is reacted with a suitable fluoride salt  $M_yY_z$  so as to abstract a fluoride ion, if necessary under  $XF_m$ -catalysis, wherein X is selected from the group consisting of B, Al, Ga, In, P, As and Sb,

M is a monovalent or bivalent cation,

m is 3 or 5 and

n is 2, if m is 3, and/or

n is 4, if m is 5,

y is 1 or 2, provided that, if y is 1, Y is a monovalent anion,

or if y is 2, Y is a bivalent anion, and

z is 1 or 2, provided that, if z is 1, M is a monovalent cation,

or if z is 2, M is a bivalent cation.

2. The method according to claim 1 for the production of salts of weakly coordinating anions of the type corresponding to the following formula (1'), (2') or (3'):



wherein, in a first step an aluminum triorganyl compound  $\text{AlR}_m$  is reacted with a partially or completely fluorinated alcohol  $^F\text{ROH}$  in an organic, aprotic solvent, and then, in a second step, the resulting aluminum trialkoxy compound  $\text{Al}(\text{OR}^F)_3$  is reacted with a tetrafluoroborate salt  $\text{M}(\text{BF}_4)_z$ , if necessary, under  $\text{BF}_3$ -catalysis.

3. A method according to claim 1 or 2, wherein the aluminum trialkoxy compound  $\text{Al}(\text{OR}^F)_3$  is reacted with the tetrafluoroborate salt  $\text{M}(\text{BF}_4)_z$  at a ratio of 1:1, if  $z$  is 1, or is reacted at a ratio of 2:1, if  $z$  is 2.

4. A method according to claim 1 or 2, wherein the aluminum trialkoxy compound  $\text{Al}(\text{OR}^F)_3$  is reacted with the tetrafluoroborate salt  $\text{M}(\text{BF}_4)_z$  at a ratio of 2:1, if  $z$  is 1, or is reacted at a ratio of 4:1, if  $z$  is 2.

5. A method according to any one of the preceding claims, wherein the organic, aprotic solvent is selected from the group consisting of pentane, hexane, heptane, octane, benzene, toluene, cresol, chlorobenzene and trichlorobenzene.

6. A method according to any one of the preceding claims, wherein R is a radical selected from the group consisting of hydrogen, methyl, ethyl, n-propyl, i-propyl, n-butyl, i-butyl, t-butyl, phenyl and toyl.

7. A method according to any one of the preceding claims, wherein  $\text{R}^F$  is selected from the group consisting of linear or branched, partially or completely fluorinated  $C_1$  to  $C_{10}$  alkyl groups, partially or completely fluorinated  $C_6$  to  $C_{20}$  aryl groups, and partially or completely fluorinated  $C_3$  to  $C_{10}$  cycloalkyl groups.

8. A method according to any one of the preceding claims, wherein, if  $z$  is 1, M is selected from the group consisting of alkali metal ions,  $\text{In}^+$ ,  $\text{Ti}^+$ ,  $\text{Ag}^+$ ,  $\text{Cu}^+$ ,  $\text{NR}'_4^+$ ,  $\text{PR}'_4^+$ , wherein  $\text{R}'$  is, independently in each case, hydrogen, a linear or branched  $C_1$  to  $C_{20}$ -alkyl radical or substituted or unsubstituted aryl radical, and imidazolium, or, if  $z$  is 2, M is selected from the group

consisting of Ni<sup>2+</sup>, Cu<sup>2+</sup>, Zn<sup>2+</sup>, Pd<sup>2+</sup>, Rh<sup>2+</sup>, and Pt<sup>2+</sup>.

9. A method according to any one of claims 1 to 8, wherein, in a first step, the aluminum triorganyl compound AlMe<sub>3</sub> is reacted with a partially or completely fluorinated alcohol <sup>F</sup>ROH in pentane at a ratio of 1:3 and then, in a second step, the resulting aluminum trialkoxy compound Al(OR<sup>F</sup>)<sub>3</sub> is reacted with tetrafluoroborate salt M(BF<sub>4</sub>)<sub>z</sub> at a ratio of 1:1, if z is 1, or at a ratio of 2:1, if z is 2, to yield a compound corresponding to formula (1') above.

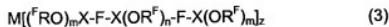
10. A method according to any one of claims 1 to 8, wherein, in a first step, the aluminum triorganyl compound AlMe<sub>3</sub> is reacted with a partially or completely fluorinated alcohol <sup>F</sup>ROH in pentane at a ratio of 1:3 and, then in a second step, the resulting aluminum trialkoxy compound Al(OR<sup>F</sup>)<sub>3</sub> is reacted with tetrafluoroborate salt M(BF<sub>4</sub>)<sub>z</sub> at a ratio of 2:1, if z is 1, or at a ratio of 4:1, if z is 2, to yield a compound corresponding to formula (2') above.

11. A method according to any one of claims 1 to 8, wherein, in a first step, the aluminum triorganyl compound AlMe<sub>3</sub> is reacted with a partially or completely fluorinated alcohol <sup>F</sup>ROH in heptane at a ratio of 1:3 and then, in a second step, the resulting aluminum trialkoxy compound Al(OR<sup>F</sup>)<sub>3</sub> is reacted with tetrafluoroborate salt M(BF<sub>4</sub>)<sub>z</sub> at a ratio of 2:1 if z is 1, or at a ratio of 4:1, if z is 2, to yield a compound corresponding to formula (3') above.

12. A method according to any one of claims 9 to 11, wherein R<sup>F</sup> is (F<sub>3</sub>C)<sub>3</sub>C.

13. A method according to any one of claims 9 to 12, wherein M is Ag<sup>+</sup> or NBu<sub>4</sub><sup>+</sup>.

14. Salts of weakly coordinating anions corresponding to formula (3):



wherein X is selected from the group consisting of B, Al, Ga, In, P, As and Sb,

M is a monovalent or bivalent cation,

m is 3 or 5 and

n is 2, if m is 3, and/or

n is 4, if m is 5,

z is 1 or 2, provided that, if z is 1, M is a monovalent anion,

and/or if z is 2, M is a bivalent anion, and

wherein, if z is 1, M is selected from the group consisting of alkali metal ions,  $\text{In}^+$ ,  $\text{Ti}^{+2}$ ,  $\text{Ag}^+$ ,  $\text{Cu}^+$ ,  $\text{NR}_4^+$ ,  $\text{PR}_4^+$ , wherein R' is, independently in each case, hydrogen, a linear or branched C<sub>1</sub> to C<sub>20</sub>-alkyl radical or substituted or unsubstituted aryl radical, and imidazolium, or, if z is 2, M is selected from the group consisting of  $\text{Ni}^{2+}$ ,  $\text{Cu}^{2+}$ ,  $\text{Zn}^{2+}$ ,  $\text{Pd}^{2+}$ ,  $\text{Rh}^{2+}$ , and  $\text{Pt}^{2+}$ , and R<sup>F</sup> is selected from the group consisting of linear or branched, partially or completely fluorinated C<sub>1</sub> to C<sub>10</sub> alkyl groups, partially or completely fluorinated C<sub>6</sub> to C<sub>20</sub> aryl groups, and partially or completely fluorinated C<sub>3</sub> to C<sub>10</sub> cycloalkyl groups.

15. The salts of weakly coordinating anions according to claim 14, represented

by the formula (3'):



wherein z, M and R<sup>F</sup> are as defined above.

16. The salts according to claim 14 or 15, wherein M is  $\text{Ag}^+$  or  $\text{NBu}_4^+$  and R<sup>F</sup> is  $(\text{F}_3\text{C})_3\text{C}$ .

17. Use of a salt according to any one of claims 14 to 16 or prepared according to the method of any one of claims 1 to 13, in ionic fluids, in lithium ion batteries, as a conducting salt in electrochemistry or in homogeneous catalysis.

18. An alkoxy compound of an element, represented by formula (4):



wherein X is selected from the group consisting of B, Al, Ga, In, P, As and Sb,

m is 3 or 5 and

R<sup>F</sup> is selected from the group consisting of linear or branched, partially or completely fluorinated C<sub>1</sub> to C<sub>10</sub> alkyl groups, partially or completely fluorinated C<sub>6</sub> to C<sub>20</sub> aryl groups, and partially or completely fluorinated C<sub>3</sub> to C<sub>10</sub> cycloalkyl groups.

19. The alkoxy compound of an element according to claim 18, wherein X is Al.